Lesson Two

Meteorology, climate warming and/or El Niño

Outcomes

All states and territories expect that as a result of their school studies in Science, students should appreciate the relevance of scientific knowledge to their future career (whether the job is in a scientific field or not). Such outcomes are stated most specifically in the New South Wales Science syllabus:

- 4.5 – A student describes areas of current scientific research
- 5.5 – A student analyses how current research might affect people's lives.

In working toward these outcomes students learn *(among other things)* to:

- identify scientific skills that can be useful in a broad range of careers
- identify possible career paths in science.

Materials Required:

- Careers in Science booklet (class sets are available by emailing enquiries@ansto.gov.au or calling 02 9717 3168. It is also online at www.careersinscience.gov.au).

Aim of this lesson

Students will be introduced to an aspect of meteorology, such as global warming or El Niño. It will provide them with a contextual understanding of meteorology which will be useful in their daily life, as well as constituting the basic knowledge required in a number of potential scientific careers.

Activities

1. What is meteorology?

Use the cartoons (pages 2–8) to identify some examples of topics involved in the study of meteorology.

In pairs or groups, ask the students to use the cartoons to identify some examples of the type of studies involved in meteorology – the topic for the next series of lessons. If students find this difficult the teacher should ask the class to describe what they think meteorologists study. Remind students that weather bureaus are called Bureaus of Meteorology in many places.

Possible responses:

- Global warming
- El Niño
- Prediction of floods or drought.

2. Meteorology and jobs

Ask the students to consider the question, 'In which type of science-related jobs could you use this meteorological knowledge?'

Refer students to the science-related jobs on page ten.

Also encourage students to consider jobs that their friends and relatives do. Ask them to think about how, if at all, knowledge of the topics identified in Activity 1 could be useful.

Another approach could be to perform a Google search of the terms 'careers' and 'meteorology'.

This could be done as a group activity with each group required to report to the class on how they think a knowledge of some aspect of meteorology would be useful in one or two careers they have identified.

Possible responses:

- Prediction of higher-than-average rainfall periods could be useful to farmers, enabling them to decide on planting or harvesting times for maximum crop yields, avoiding destruction by floods

- Such knowledge would also be potentially very useful to tour operators who conduct adventure tours such as white-water rafting or exploration of wild river systems. It would enable them to avoid taking tourists into certain areas when potentially dangerous flood conditions might occur
- An understanding of the nature of global warming and its causes could be used by an Environment Protection Authority officer if he/she needs to provide advice about emissions to a factory owner. Alternatively, such knowledge could be used by the factory owner if he/she wants to be able to argue that his/her practices are environmentally acceptable.

3. Comments from scientists

Look at comments from working scientists and others:

- Ecologist (page two)
- Agricultural officer (page four)
- Derivatives trader (page four)
- Winemaker (page five)
- Dr Karl (page six).

Ask the students, 'Does studying or working in meteorology or other scientific fields help to develop skills that could be used elsewhere, or help you to understand things you might meet in everyday life?'

Possible responses:

- Helps develop skills such as problem solving, gathering data and coming to conclusions
- Enables an understanding of environmental problems, allowing for everyday happenings to be looked at in an environmentally focused way.

REMEMBER: Up to this point in the lesson, class answers should be treated as contributions to the discussion rather than definitive answers that are right or wrong. At this point the students are still in the stage of engagement and exploration of the topic. It is not until you begin to deal with the specifics of the content that you will want to deal with any misconceptions, or errors of fact or procedure.

4. Beginning the topic to be studied

Having told the students that the topic for the next few lessons is related to global warming, El Niño or droughts and floods, refer the students back to the cartoon.

They should work in pairs or groups to identify:

- the sort of problems they might be able to suggest solutions for
- questions they would like answers to.

Encourage the students to use the cartoon as a stimulus for their thoughts and to come up with at least one or two additional ideas of their own.

In a whole class discussion led by the teacher, choose a number of questions to be addressed in the following lessons, thus establishing a link between the formal studies and the student interests.